

***RETRIEVALS OF CLOUD OPTICAL DEPTH AND EFFECTIVE RADIUS FROM A
THIN-CLOUD ROTATING SHADOWBAND RADIOMETER (TC-RSR)***

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For presentation at
The Second Science Team Meeting of the
Atmospheric System Research (ASR) Program,
San Antonio, TX
March 28-April 1, 2011

**Environmental Sciences Department/Atmospheric Sciences Division
Brookhaven National Laboratory**

**U.S. Department of Energy
Office of Science**

ABSTRACT

A thin cloud-rotating shadowband radiometer (TC-RSR) was developed and deployed in a field campaign at the ARM SGP site. The TC-RSR measures the forward scattering lobe of the direct solar beam (i.e., the solar aureole) through a thin cloud. We applied Min and Duan's retrieval algorithm to the field measurements of TC-RSR to derive cloud optical depth, effective radius, and LWP from the measured forward scattering lobe of the direct solar beam. After carefully calibrating and pre-processing, the retrieved cloud optical depth, effective radius, and LWP from TC-RSR showed reasonable agreement with other retrievals of MFRSR, MWR, and AERI. Our results indicate that the TC-RSR is able to simultaneously retrieve cloud optical depth, effective radius, and LWP for optically thin water clouds.

NOTICE: This manuscript has been authored by employees of Brookhaven Science Associates, LLC under Contract No. DE-AC02-98CH10886 with the U.S. Department of Energy. The publisher by accepting the manuscript for publication acknowledges that the United States Government retains a non-exclusive, paid-up, irrevocable, world-wide license to publish or reproduce the published form of this manuscript, or allow others to do so, for United States Government purposes.